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MCDERMOTT WILL & EMERY
600 13TH STREET, N.W.
WASHINGTON, DC 20005-3096

EXAMINER

POON, KING Y

ART UNIT	PAPER NUMBER
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2624

DATE MAILED: 05/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/441,657

Applicant(s)

MIYAGAWA, YUTA

Examiner

King Y. Poon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 11-16 is/are rejected.
- 7) ☒ Claim(s) 4-10, 11-16 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 November 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner. *See PTO 948*
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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DETAILED ACTION

Specification

1. The title of the invention is objected to because the title is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

2. Claim 4 is objected to because of the following informalities: "said optical shutter element" found in line 9 should be "said optical shutter elements" to be consistent with the "optical shutter elements" found in line 3 and "said optical shutter elements" found in lines 6- 7. Appropriate correction is required.

Claims 5-10 are objected to because they depend on objected claim 4.

Claim 11 is objected to because of the following informalities: "the electro-optic element" found in line 6 should be "electro-optic shutter elements" to be consistent with the "electro-optic elements" found in line 2 and "electro-optic elements" found in lines 4-5.

Appropriate correction is required.

Claims 12-16 are objected to because they depend on objected claim 11.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-3, 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1: Claim 1 recites the limitation "a predetermined number of bits" in line 9. There is insufficient antecedent basis for this limitation in the claim.

It is unclear whether the "a predetermined number of bits" is the same predetermined number of bits found in lines 7-8, or another predetermined number of bits.

Regarding claim 2: Claim 2 is rejected under 35 U.S.C. 112, second paragraph because claim 2 depends on rejected claim 1.

Regarding claim 3: Claim 3 recites the limitation "the predetermined number of bits" in line 2. There is insufficient antecedent basis for this limitation in the claim.

It is unclear whether the "the predetermined number of bits" is the predetermined number of bits found in lines 7-8 of claim 1, or the predetermined number of bits found in line 9 of claim 1.

Regarding claim 15: Claim 15 recites the limitation "the number corresponding to the image data" in lines 4-5. There is insufficient antecedent basis for this limitation in the claim.

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It is unclear whether the “the number corresponding to the image data” is “predetermined number of bits” found in lines 5-6 of claim 11, or the “maximum gradient” found in line 7 of claim 11, or any number that is related to the image data.

Regarding claim 16: Claim 16 is rejected under 35 U.S.C. 112, second paragraph because claim 16 depends on rejected claim 15.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The change made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999

(AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b).

Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1-3, 11-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Fujita et al. (US 5,872,587)

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The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claim 1: Fujita teaches an optical shutter drive device (fig. 12) comprising: an optical shutter module (light shutter array, column 9, lines 64-65) arraying a plurality of optical shutter elements (shutter elements, column 9, line 67, column 10, line 1) having an electro-optic effect (column 2, line 14); and a driver (driver IC, column 10, line 6) for modulating the ON time (column 10, lines 26-33) of each optical shutter element (column 10, lines 5-8) based on the image data (image data, column 10, lines 33-45); wherein the driver can modulate (modulating, column 10, line 28) each optical shutter element (fig. 13, fig. 14 showing how one particular shutter element is being turned on or off) at a gradient (e.g., area 1 is turned on all the time, fig. 13, and fig. 14, which corresponds to a gradient/tones of 32, column 10, line 36; or area 2, fig. 14, 15, is turned on with a tone of 16, column 12, line 36) corresponding to a predetermined number of bits, (there are 6 image bits to drive 6 time zones of a picture element, column 10, lines 33-40). The predetermined number of bits for each time zone is one (column 11, lines 34-36) and the maximum gradient corresponding to one bit is 32 which is located at area 1, fig. 13, fig. 14, and the minimum gradient corresponds to one bit is 1 which is located at area 6. The IC driver

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also drives the element to print at a gradient of 64 corresponds to all six image bits) so as to drive the optical shutter element at a gradient (e.g., the gradient/tone of 48, 110000, fig. 14; column 11, lines 34-35 teaches each of the six bits of image data are set in either 1's or 0's) exceeding a maximum gradient (e.g., the maximum tone 32 at area 1; 48 exceed 32) at a predetermined number of bits (one bit) without turning OFF the optical shutter element (see the optical shutter is not being turned off when the gradient/tone exceeds 32. I.e., extended from area one into area two) when driving one line. (Column 11, line 14 and lines 20-23)

Regarding claim 2: Fujita teaches wherein the driver turns ON each optical shutter element with a dispersed timing. (See CL is being dispersed into AND gates (174) which drives individual shutter element, e.g., 162(1), 162(2) . . . , fig. 15)

Regarding claim 3: Fujita teaches wherein the predetermined number of bits (e.g., the one bit that drives area 1, fig. 13, fig 14) is fewer than the number of bits of the image data. (Six bits of image data, column 10, lines 34-35)

Regarding claim 11: Fujita teaches an electro-optic (column 2, line 14) element drive device (fig. 12) comprising: electro-optic elements (shutter elements, column 9, line 67, and column 10, line 11) having an electro-optic effect (column 2, line 14); and a driver (driver IC, column 10, lines 5-8) for modulating the ON time (column 10, lines 27-32) of the electro-optic elements based on the image data (column 10, lines 18-19) by a predetermined number of bits, (e.g., the ON/OFF time of the electro-optic elements are driven by one bit (predetermined number of bits) of image data of fig., 13, and fig. 14, column 11, lines 20-36; i.e., element 162 (1)

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is driven by one bit of image data and element 162(2) is driven by one bit of image data, fig. 15) and driving the electro-optic elements at a gradient (e.g., the electro-optic elements are driven at 48, 110000, fig. 14; column 11, lines 34-35 teaches each of the six bits of image data are set in either 1's or 0's) exceeding a maximum gradient (e.g., the maximum tone 32 at area 1; 48 exceed 32) corresponding to the predetermined number of bits (1 bit in the example, see note).

Note: there are 6 image bits to drive 6 time zones of a picture element, column 10, lines 33-40. The predetermined number of bits for each time zone is one (column 11, lines 34-36) and the maximum gradient corresponding to the one bit is 32 which is located at area 1, fig. 13, fig. 14, and the minimum gradient corresponds to one bit is 1 which is located at area 6.

Regarding claim 12: Fujita teaches wherein the predetermined number of bits (e.g., the one bit that drives area 1, fig. 13, fig 14) is fewer than the number of bits of the image data. (Six bits of image data, column 10, lines 34-35).

Regarding claim 13: Fujita teaches wherein the electro-optic elements are optical shutter. (Light shutter, column 9, lines 64-65).

Regarding claim 14: Fujita teaches, wherein the driver turns ON each electro-optic elements with a dispersed timing. (See CL is being dispersed into AND gates (174) which drives individual shutter element, e.g., 162(1), 162(2) . . . , fig. 15)

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7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 15 is rejected under 35 U.S.C. 103(a) as being obvious over Fujita et al. as applied to claim 11 above and further in view of Pederson et al (US 3,938,144).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e).

This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at

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the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

Regarding claim 15: Fujita teaches a signal generation circuit (178, fig. 15) for providing a clock signal to synchronize image data shifting in a shift register, (column 12, lines 1-10), and a strobe signal for controlling the timing of a latching circuit to latch the image data in the shift register and for turning on each electro-optic element (the elements are driving at a gradient exceeding maximum gradient, see claim 11; when exceeding maximum gradient, the elements are turned on when the strobe signal is sent, column 12, lines 1-10).

Fujita does not teach a counter for counting standard clock signals, wherein the driver turns ON each electro-optic elements when count value of the counter reaches to the number corresponding to the image data.

However, Pederson, in the same area of sending shift pulses signal (column 25, line 3) to a shift register (column 25, line 4) for receiving and shifting data (column 25, line 5, fig. 10) and use a strobe signal (strobe pulse, column 25, lines 8-9) to control the timing of data in the shift register to be latched into a latching circuit (column 25, lines 10-11), teaches to use a counter (column 25, line 10) for counting standard clock signals (clock pulse, column 25, lines 60-68) and when the count value of the counter reaches a number (number 9, column 25, line 64), the counter sends out the strobe signal through gate 373 to the latch circuit for latching the data (column 25, lines 64-65, fig. 10).

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Therefore, it would have been obvious to a person with ordinary skill in the art at the time the invention was made to have modified Fujita's signal generating circuit (178, fig. 15) to include: a counter for counting standard clock signals and when the count value of the counter reaches to the number (the number that corresponds to all the image data/data are in the shift register, see Pederson, column 25, lines 60-65) corresponding to the image data, generates a signal such that the strobe signal would be sent.

It would have been obvious to a person with ordinary skill in the art at the time the invention was made to have modified Fujita's signal generating circuit by the teaching of Pederson because of the following reasons: the strobe signal of Fujita cannot be sent at any time. For example, if the strobe signal is sent before all the image data bits are being shifted into the right position within the shift register, wrong image data is being latched and the printer would print garbage. Providing a counter for controlling the timing of sending the strobe signal would ensure image data are in the shift register before the strobe signal is sent. (Column 25, lines 60-66, Pederson)

Since the strobe signal, in Fujita, is used for controlling the timing of a latching circuit to latch the image data in the shift register and for turning on each electro-optic element after the image data has been latched; Fujita as modified by Pederson teaches a counter for counting standard clock signals, wherein the driver turns ON each electro-optic elements when count value of the counter reaches to the number (the number that corresponds to all the image data/data are in the shift register) corresponding to the image data.

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Allowable Subject Matter

9. Claims 4-10 would be allowable if rewritten to correct the objection.

10. Claim 16 would be allowable if rewritten to overcome the rejection(s) under 35

U.S.C. 112, 2nd paragraph and the objection, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 4-10: Independent claim 4 discloses optical recording device using a driver for dividing one line into plurality sections, turning on shutter elements based on image data for each section by a predetermined number of bits, and driving the shutter elements at a gradient exceeding a maximum gradient corresponding to the predetermined number of bits; “wherein the one line is divided into sections in the subscan direction; and wherein a comparator for turning ON each shutter element, comparing the value latched in a latched register, for image data of one section, with the count value of the counter, and turning OFF each optical shutter element when both values match.” The closest prior art Fujita et al. (US5,872,587) shows a similar optical recording device. However, Fujita et al., either singularly or combine with other cited references, fail to anticipate or render the limitations “wherein the one line is divided into sections in the subscan direction; and wherein a comparator for turning ON each shutter element, comparing the value latched in a latched register, for image data of one section, with the count value of the

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counter, and turning OFF each optical shutter element when both values match” obvious when combine with other claimed limitations.

Regarding claim 16: The present invention is directed to an electro-optic element for printing a gradient exceeding a maximum gradient corresponding to the predetermined number of bits. Claim 16 identifies the uniquely distinct features “wherein the counter resets the count value without counting the standard clock signals corresponding to the maximum gradient.” The closest prior art, Fujita et al. (US 5,872,587) teaches an electro-optic element for printing a gradient exceeding a maximum gradient corresponding to the predetermined number of bits, either singularly or combine with other cited reference, fail to anticipate or render the above limitations obvious when combine with other claimed limitations.

12. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Wada et al. (US 6,278,474) teaches printing using optical shutter elements.

Miyagawa (US 6,081,321) teaches printing using optical shutter elements.

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Tanuma et al. (US 5,539,525) teaches to print different gray images using optical array.

Jones et al. (US 6,094,187) teaches light modulating devices for optical shutter.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to King Y. Poon whose telephone number is (703) 305-0892.

May 11, 2003

King Yau Poon